

Electride Hollow Cathode, Phase I

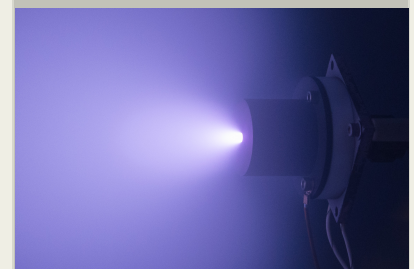
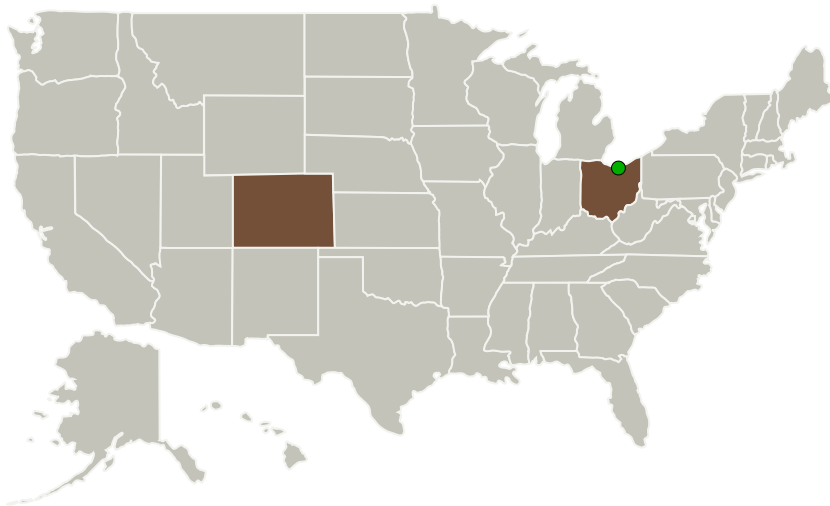
Completed Technology Project (2015 - 2015)



Project Introduction

Plasma Controls, LLC will develop hollow cathode electron sources based on a novel inorganic electron emitting material. Current state of the art cathodes include barium oxide based cathodes, which are susceptible to contamination, and lanthanum hexaboride cathodes, which must be operated at very high temperatures. In contrast, electride cathodes may provide equivalent emission to existing hollow cathode insert materials at lower working temperatures and lower powers, possibly extending cathode life and simplifying cathode construction and operation. In addition, a modified hollow cathode design will be used to facilitate rapid plasma ignition.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Plasma Controls, LLC	Lead Organization	Industry	Fort Collins, Colorado
● Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

Primary U.S. Work Locations

Colorado	Ohio
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Project Transitions



June 2015: Project Start



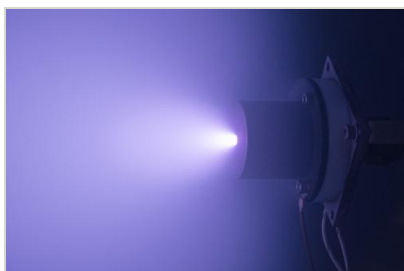
December 2015: Closed out

Closeout Summary: Electride Hollow Cathode, Phase I Project Image

Closeout Documentation:

- Final Summary Chart Image(<https://techport.nasa.gov/file/138967>)

Images



Briefing Chart Image

Electride Hollow Cathode, Phase I
(<https://techport.nasa.gov/image/133574>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Plasma Controls, LLC

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

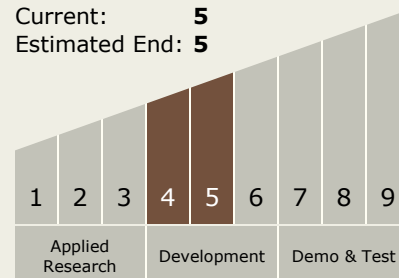
Carlos Torrez

Principal Investigator:

Casey C Farnell

Technology Maturity (TRL)

Start: 4
Current: 5
Estimated End: 5



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Technology Areas

Primary:

- TX01 Propulsion Systems
 - └ TX01.2 Electric Space Propulsion
 - └ TX01.2.2 Electrostatic

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System